



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,103	03/11/2004	Takahiro Saito	Q79127	4570
23373	7590	07/13/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			BARNEY, SETH E	
			ART UNIT	PAPER NUMBER
			3752	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/797,103	Applicant(s) SAITO ET AL.	
	Examiner Seth Barney	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 4, 5, 7 and 8 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-3, 9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on June 28, 2006. These drawings are acceptable.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 2, 3, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,769,625 to Peterson Jr. in view of Japanese Patent No. JP359128968A to Ono and U.S. Patent No. 5,862,991 to Willke et al.

Regarding claims 1 and 9, Peterson, Jr. discloses a fuel injection valve having:

-a valve seat face (134a) for allowing a valve body (126a) to be seated thereon when the valve body is closed.

-an injection port (135) formed on a downstream side of the valve seat face. See Figure 2A and 2B.

-a nozzle plate (10) connected to the valve seat member and disposed on a downstream side of the injection port, the nozzle plate being formed with a plurality of nozzle holes (142), the nozzle holes disposed radially outwardly with respect to the injection port, a fuel passage (146) having a cross section substantially perpendicular to an axis of the injection port, the cross section of the fuel passage having a diameter which is substantially gradually increased. See Figures 2A and 2B.

Peterson does not disclose a flat bottom face of the valve body, comprising a ball portion, having a diameter smaller than the inlet such that the valve body is positioned within the inlet when the valve body is closed. Ono discloses a fuel injector having a valve body, comprising a ball portion, with a flat bottom face that is positioned within an inlet. See the Figures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the ball portion of Peterson to have a flat bottom face as taught by Ono in order to produce a more effective fuel injector.

Peterson furthermore does not disclose the ball portion have a plurality of flat portions disposed circumferentially about the ball surface. Willke et al. discloses a ball portion having a plurality of flat portions. See Figures 1-8. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the

ball portion of Peterson to have a flat portions disposed circumferentially about the ball surface as taught by Willke in order to better fit the valve body.

Regarding claim 2, the fuel passage is shaped as a cone having a diameter that gradually and continuously increases away from the outlet of the injection port. See Figures 2A and 2B.

Regarding claim 3, the fuel passage is shaped into a frustum of the cone. See Figures 2A and 2B.

Regarding claim 11, the modified apparatus of Peterson would have a contact between the seal and ball that is greater than a line contact.

Allowable Subject Matter

Claims 6 and 10 are allowed.

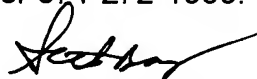
Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the art with respect to a fuel injectors having flat portion on the ball surface: Kitamura et al. and Kitamura.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seth Barney whose telephone number is (571)272-4896. The examiner can normally be reached on 7:30am-5:00pm (Mon-Fri), first friday off.

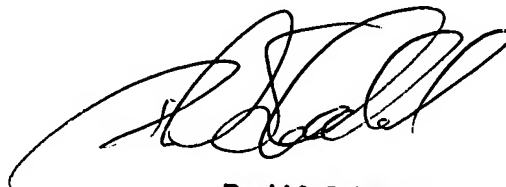
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (571)272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Seth Barney
Examiner
Art Unit 3752

sb



David A. Scherbel
Supervisory Patent Examiner
Group 3700